



**THE ANSWER IS
BACKYARD COMPOSTING AND
YARD WASTE REDUCTION!**

**COUNTY OF SANTA BARBARA
BACKYARD COMPOSTING AND
YARD WASTE REDUCTION GUIDE**

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CHOOSING THE RIGHT COMPOSTING SYSTEM



Do not waste time or money by purchasing or building a composting system that is wrong for the needs of your household. You would never buy a shovel to rake your lawn, so why do likewise with your choice of a composting bin. Before making a decision on what type of system you need, ask yourself these four simple questions...

What materials do I want to compost?

What volume of materials do I generate for composting?

How much time and effort can I dedicate to the maintenance of a composting system?

How much yard space, if any, do I have available for a composting system?

Write your answers down and compare them to the following chart (1-1). Determine what system(s) will fulfill your needs, and read more about it in the corresponding chapters.

COMPOSTING SYSTEM	COMPOSTABLE MATERIALS	AVERAGE WEEKLY VOLUME	TIME AND EFFORT REQUIRED	YARD SPACE REQUIRED
Vermi-composting	Non-fatty food waste, soft green trimmings.	Less than 8 gallons.	Initial bin set-up and maintenance of bedding moisture. No turning.	Minimal... can be indoors or outdoors.
Anaerobic	Non-fatty food waste, soft green trimmings.	Less than 6 gallons.	Minimal... soil and water must be added once per month. No turning.	Minimal.
Aerobic	Yard waste: shredded limbs, leaves and grass clippings.	Flexible... depending on the volume of materials and number of bins.	Recommended weekly to biweekly turnings and watering.	Minimal to unlimited.
Two Bin System / Anaerobic & Aerobic	See above.	See above.	See above.	Minimal to unlimited. Most adaptable.

Chart(1-1)

COMPOSTING BIN COST.

Retail composting bins can be purchased from local hardware stores and garden supply centers. Several ecologically-minded or garden-oriented mail order catalogs also carry bins. Market prices for a composting bin can range from \$30 to \$300. Homemade bins can be built from a variety of materials such as pallets, cinder blocks, or wire fencing (see section 5). Building costs vary from \$0 to \$50.

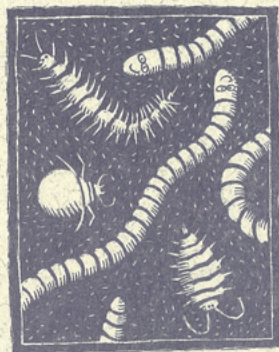


AEROBIC COMPOSTING



WHAT IS AEROBIC COMPOSTING?

Aerobic composting is the decomposition of organic matter by air breathing microorganisms and larger soil life forms. These decomposers are naturally present in the soil and thrive in a moist and nutrient-rich environment. Primary consumers such as bacteria and fungi begin the decomposition process. (In ideal conditions, the metabolism of bacteria creates the heat of the composting pile.) Second and third level consumers, such as beetles, centipedes, earthworms, and millipedes, complete the composting cycle leaving behind a dark brown humus that is soil enhancing.



CHOOSING THE RIGHT COMPOSTING SITE.

When setting up your composting system, choose a site that is level and has good drainage. Accessibility, aesthetics, and convenience should also be considered. To prevent groundwater contamination avoid a bin location near drainage courses or waterways. Premeditate your composting routine before you assemble your bin to be certain that an important necessity such as sufficient work space or access to a water supply has not been overlooked.

SETTING UP YOUR AEROBIC SYSTEM.

Using a shovel or garden fork, loosen the ground where the composting bin will rest. This, in addition to lining the bottom of the bin with a layer of bulky organic waste, such as branches, will help with drainage and aeration.

MATERIALS TO AEROBICALLY COMPOST...

Leaves
Yard trimmings
Grass clippings
Garden waste and weeds
Manure
Seaweed
Egg shells
Coffee grounds and filters
Wood ashes (small amounts)
Pet and human hair
Untreated paper towels and
tissue paper (small amounts)
Sawdust and shavings (small amounts)
Hay and alfalfa

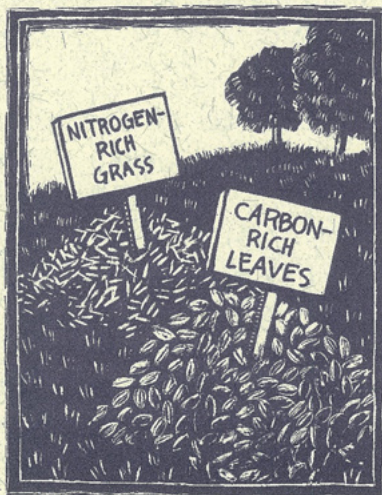
Note: Eucalyptus leaves, pine needles and palm fronds decompose slowly.

MATERIALS NOT TO AEROBICALLY COMPOST...

Pet or human waste (contain pathogens and parasites)
Charcoal briquette ash
Meat or bones
Animal fat or oil
Dairy products

COMPOSITION OF THE AEROBIC PILE.

The compost pile will require a mixture of materials rich in carbon and nitrogen for efficient decomposition. Nitrogen is most abundant in fresh green yard and garden trimmings and vegetable scraps. Other good sources are livestock manures and fresh seaweed. Carbon dominates in brown materials, such as leaves (oak leaves are an excellent source of carbon), chipped woody brush, sawdust, and straw. The proper compost mixture contains approximately 3 parts carbon-rich ingredients to 2 parts nitrogen-rich ingredients. If manures or nitrogen-rich fertilizers are used, increase the volume of carbon-rich materials in the pile. Excessive concentration of nitrogen-rich matter will often cause putrefaction of your compost pile (strong ammonia odor). Too little nitrogen will not feed the microorganisms causing decomposition to stop.



INCREASED SURFACE AREA SPEEDS THE PROCESS.

For quicker composting, shred, chop, or bruise materials being added to the compost pile. The more surface area the microorganisms have to work on, the faster the materials are decomposed. Yard trimmings can be chopped up with a machete or shovel, or run through a shredding machine or lawn mower. Material that is too fine, however, may lead to poor aeration and "death" of the pile.

PROPER AMOUNTS OF MOISTURE AND AERATION.

The compost should be kept slightly moist ("damp sponge") in order to ensure bacterial decomposition. As you build the pile, be sure to moisten all materials by layer. Do not wait until the pile is completed to moisten or you will find your compost pile shedding water like a thatched roof. In dry, hot weather, it will be necessary to water the compost once or twice a week. (This is a good opportunity to reuse your household rinse waters that do not contain concentrated detergents.) Covering a compost pile with a tarp will also help to retain moisture and will prevent nutrient leaching on rainy days.

For quicker compost, aerate your pile at least once a week for the first few weeks. For the best results, turn the fresher outside materials into the center of a newly turned pile. In addition to the traditional pitchfork, special tools can be purchased to aerate piles without tedious hand turnings. (Check with your local hardware store.)



TIME AND TEMPERATURE.

The speed of composting is dependent on the moisture, aeration, and carbon-to-nitrogen ratio. **A hot steamy compost pile is a definite indication that the ideal conditions have been met.** Only the outside of the pile will remain cool and minimally affected by decomposing organisms. Aeration and moisture are generally the main factors affecting the time necessary to produce finished compost. Weekly turnings of the pile will produce compost in 1 to 2 months; monthly turnings will produce compost in 4 to 6 months.

WHEN IT'S TIME TO HARVEST.

Compost can be harvested when it is a rich dark brown color, crumbly, and has a sweet earthy smell. Before applying to your yard or garden (see section 6), allow the finished compost to cool down for three days to several weeks.

TROUBLESHOOTING.

SYMPTOM	PROBLEM	SOLUTION
Compost pile center is damp but cold.	Lack of nitrogen.	Add nitrogen-rich materials such as animal manure, fresh grass clippings, seaweed, or blood meal.
Compost has a bad odor.	Anaerobic conditions.	Turn pile. Add bulking material if pile too fine.
Compost has an ammonia-like odor.	Too much nitrogen (putrification).	Turn pile, add carbon-rich materials.
Center of pile is dry.	Not enough moisture.	Water pile while turning.
Compost is warm and damp in the middle but nowhere else.	Too small.	Increase volume of the pile with yard waste, grass clippings, or garden trimmings.

ANAEROBIC COMPOSTING



WHAT IS ANAEROBIC COMPOSTING?

Anaerobic composting is the slow decay of organic matter through fermentation. Unlike aerobic composting, the pile will not heat up. Microorganisms that thrive in a low-oxygen environment (mostly bacteria) reduce nitrogen-containing or sulfur-containing compounds found in organic matter to yield humus, organic acids, and gases.

SETTING UP YOUR ANAEROBIC SYSTEM.

Ideally, two anaerobic composting bins should be used to allow for continuous composting. While one is finishing composting, the other can be filled. If you plan to construct a homemade composting bin, be sure to choose a bottomless barrel with a lid that seals tightly and has a capacity of 35 gallons or more (see section 5).

An anaerobic composting bin should be located in a spot with good drainage. Accessibility, aesthetics, and convenience should also influence where your bin is placed. If located under or next to fruit trees, they will benefit from the added moisture and nutrients. To prevent the contamination of water, avoid a bin location near waterways or drainage courses. To prepare the site, dig a hole 6 to 12 inches deep, set the bin into the hole, and pack dirt firmly around the bin. Lining the bottom of your bin with 1/4" bird wire will fortify it from scavengers, but will allow earthworms to enter.



MATERIALS TO ANAEROBICALLY COMPOST...

Non-fatty kitchen scraps
Houseplant clippings
Grass clippings (small amounts)
Egg shells
Coffee grounds and filters
Tea bags
Pet and human hair
Wood ash (small amounts)
Untreated paper towel and tissue

MATERIALS NOT TO ANAEROBICALLY COMPOST...

Pet or human waste (contains pathogens and parasites)
Meat and bones
Animal fat or oil
Dairy products
Barbecue briquettes or ashes
Woody yard trimmings
Large Quantities of Leaves

HOW THE SYSTEM WORKS.

Anaerobic composting works best with nitrogen-rich materials such as non-fatty kitchen scraps and soft green clippings. **Avoid adding carbon-rich materials such as dry leaves, sawdust and woody yard waste.** (These materials will retard or even halt the anaerobic composting process and should be composted aerobically.)

Do not open your anaerobic composting bin more than two times per week. Over exposure to oxygen impedes beneficial microorganisms and slows efficient composting. Frequent trips to the composting bin can be reduced by simply storing daily food scraps in a sealed garbage pail that can be placed under the sink or in the refrigerator.

Two inches of soil or finished compost should be added to your bin once a month to inoculate it with the necessary microorganisms and to keep the fruit fly population down.

INCREASED SURFACE AREA SPEEDS THE PROCESS.

Once again, the more surface area the microorganisms have to work on, the faster the materials will decompose. Chopping or bruising kitchen scraps and soft green clippings will speed up the composting process.

KEEP IT MOIST.

Always keep the materials in your anaerobic composting bin moist. If the material gets too dry, it will not compost. Proper moisture content will help to exclude oxygen from your compost and keep fruit flies and ants from invading your bin. An anaerobic composting bin should be watered at least once a month or before it is dry. It can never be overwatered, so take advantage of household rinse waters which do not contain detergents, bleach, or boron/borax to water compost.



TIME AND TEMPERATURE.

Anaerobic compost will require up to three months to mature once the bin is full depending on the moisture content and the type of materials being composted. Although this system will not achieve high, sustained temperatures, pathogens dangerous to people and pets will be destroyed over time.

HARVESTING YOUR FINISHED ANAEROBIC COMPOST.

Organic material added to the composting bin will, over time, reduce in volume due to the fermentation process. When the bin reaches full capacity, a second bin can be started. Finished compost will be dark brown and moist. It should be allowed to dry and aerate for one to two weeks before using. To harvest the finished compost, simply pull up the container, shovel the contents aside, and place the bin back in the hole. Anaerobic compost can be applied to the yard and garden using techniques described in section 6.

KEEPING YOUR ANAEROBIC COMPOSTING BIN HEALTHY.

A moist anaerobic composting pile with a "slimy" consistency and a slight sulfur odor are sure signs that your bin is working properly. Do not be alarmed by the presence of insect larvae, worms, beetles, and other scavenging organisms. They are all part of the composting process and also indicate a productive bin.

TROUBLESHOOTING.

SYMPTOM	PROBLEM	SOLUTION
Ant population around base and in bin.	Bin is dry.	Soak bin contents with water. Pack down if necessary. Never spray pesticides.
Interior of composting bin has large fruit fly population.	Bin is dry.	Soak bin contents with water, add two inches of soil, limit bin opening to one or two times per week. Never spray pesticides.
Bin materials will not compost.	Too much woody waste has been added, lack of moisture.	Soak bin contents with water, discontinue adding woody waste.
Outside of bin is being dug up.	Opossums, skunks, raccoons or other scavengers are feeding on your bin's compost and earthworms.	Line the bottom and sides of the composting bin with 1/4" bird wire. Discontinue adding fatty kitchen scraps.
Soup-like compost with a large fly population.	Insufficient drainage (rarely occurs).	If homemade bin, be certain that the bottom of the composter is removed, relocate to an area with better drainage.

A **healthy** anaerobic bin often has traits considered **unhealthy** in an aerobic bin, so always read your directions carefully, and contact the County Composting Hotline whenever you have questions or need technical assistance.

VERMICOMPOSTING



WHAT IS VERMICOMPOSTING?

Vermicomposting is the use of worms to consume organic waste. This efficient and odor free method of composting produces nutrient-rich worm castings. Organisms, such as bacteria and sow bugs, also assist in this aerobic composting process. Vermicomposting is ideal for small amounts of non-fatty food scraps, leaves, and soft green trimmings.

VERMICOMPOSTING BINS.

A worm bin can be built for approximately \$35 (see section 5) or purchased through mail order gardening supply catalogs. The bin must have sufficient aeration, drainage, and a secure lid to exclude scavengers, flies and cats. (It can be an appealing litter box.) Bin size depends on the average amount of food waste your household produces in one week and can be calculated using the following formula:

One square foot of surface area per pound of garbage produced per week.

For example, a bin that is approximately 8"x 24"x 24" (4 square feet) would be suitable for a household producing 4 pounds of garbage per week.

THOSE HUNGRY LITTLE CREATURES, THE WORMS.

Red worms (*Eisenia foetida* and *Lubricus rubellus*) are excellent for vermicomposting. They thrive in confinement, reproduce quickly, and in one day eat their weight in food. Red worms are surface feeders naturally found under decaying organic matter or animal manures. They can be purchased from bait shops, gardening stores, or mail order catalogs. *Do not use night crawlers and common garden worms which require tunnels and deep soils.* To determine how many worms your bin will require, use this simple formula:

2 pounds of worms to every one pound of garbage produced per day.

As an example, a family producing an average of 2 pounds of kitchen scraps a day will need approximately 4 pounds of worms for their bin. (There are approximately 1000 worms per pound.) If you are adding more food waste than you originally estimated, do not add more worms. The population will naturally increase with the larger food supply.

BEDDING MATERIALS AND MOISTURE.

The bedding in a vermicomposting bin retains moisture, reduces odors, and serves as food for the worms. It is also used as a "retreat" for the worms when the heat of decomposing food waste becomes intolerable for them. Worm bedding can be purchased or made from animal manure, leaf mold, decaying leaves, newspaper strips, or shredded cardboard. Newspaper (no colored ink) ripped into one inch strips is a simple and inexpensive choice. Although acidic, Canadian peat moss, in small amounts, can be mixed with a newspaper or animal manure bedding to aid in moisture retention and decrease bedding density. The medium must have a moisture content of 75% to 95% water while maintaining proper aeration. These conditions are essential for the worms to respire.



SETTING UP YOUR VERMICOMPOSTING SYSTEM.

Place your vermicomposting bin in a location that is accessible, like your porch, garage or under the kitchen sink. Make sure that the area you choose is shady and has moderate temperatures (55 to 75 degrees). The following materials will then be needed to prepare your bin for vermicomposting:

Moistened bedding
Canadian peat moss (optional)
2 to 3 handfuls of soil
Redworms
A black tarp or trash bag (optional)

Combine moistened bedding, peat moss (no more than 1/4 of the total mixture), and soil in the bin. Spread the worms onto the bedding and allow them to gradually move below the surface. Organic waste can then be discarded into a carefully dug hole in the medium and covered with one inch of bedding to exclude flies. Rotate garbage burial spots each time to minimize the disturbance of the worms. If your bin does not have a lid, then cover the entire bedding surface with a black tarp or plastic trash bag. This will block out light and aid in moisture retention.

MATERIALS TO VERMICOMPOST...

Vegetable scraps
Fruit peels and rinds
Coffee grounds and filters
Grains
Tea bags
Stale bread
Plant clippings and leaves
Untreated paper towels and tissue

MATERIALS NOT TO VERMICOMPOST...

Pet or human waste (contains pathogens and parasites)
Plastic or aluminum foil
Pesticide treated plant trimmings
Dairy products
Meat or bones
Animal fat or oil
Woody waste
Detergents and other laundry aids

HEALTHY, HAPPY, HUNGRY WORMS.

Although a vermicomposting bin does not require a balanced carbon-to-nitrogen ratio like aerobic composting, a proper “diet” will help maintain a healthy stock of worms. To aid in the decomposition process chop, shred, or bruise all organic waste prior to placement in the vermicomposting system.

HARVESTING YOUR FINISHED VERMICOMPOST.

As worms digest the bedding and food waste, dark brown castings will be produced. After 4 to 6 months, the vermicompost should be pushed to one side of the bin and fresh bedding placed in the other. For approximately one month bury garbage in the fresh bedding to allow the older compost to complete the maturation process. After harvesting the finished compost, add more bedding. Vermicompost is a nutrient rich soil amendment that is excellent for your garden, yard, and houseplants (see section 6).

KEEPING YOUR VERMICOMPOSTING SYSTEM HEALTHY.

The success of a worm composting bin ultimately depends on its minimal but essential upkeep. Failure to maintain proper moisture content, aeration, food supply, temperature, and bedding will lead to the decline of your worm population and a box full of rotting garbage. Disease, scavengers, and the presence of a natural predator, such as ants, may also explain a reduced population. If your bin does go into decline, don’t give up hope. A worm population can be restored by correcting the problem and reducing the amount of food normally added to the bin until their numbers increase.

TROUBLESHOOTING.

SYMPTOM	PROBLEM	SOLUTION
Large fly population, fungus or gnats.	Exposed food, acidic conditions, *surface fungus growth. *Surface fungus occurs naturally in a compost bin and provides food for the worms.	Add a one inch layer of fresh bedding, water thoroughly, secure bin cover or lid. Add a small dosage of baking soda. Do not use pesticides.
Bin has a rotten egg odor, worm population has decreased dramatically.	Anaerobic conditions.	Add fresh bedding and “fluff up,” allow to dry some.
Large ant population.	Bedding is too dry.	Keep bedding moist. Eliminate ant route and nest site. Do not use pesticides.



THE COUNTY'S RECYCLING HOTLINE
(805) 568-3051

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PUBLIC WORKS DEPARTMENT
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123 EAST ANAPAMU STREET
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